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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,914	10/14/2003	Erez Yahalomi		7454

7590 04/05/2006  
Erez Yahalomi  
Tarpad 8  
Ramat Hasharon, 47250  
ISRAEL

EXAMINER

WILSON, SCOTT R

ART UNIT PAPER NUMBER

2826

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/686,914	Applicant(s) YAHALOMI, EREZ	
	Examiner Scott R. Wilson	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-8,10,13,16,19,21-23,28,30,31,37-39 and 41-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-8,10,13,16,19,21-23,28,30,31,37-39 and 41-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Response to Arguments***

Applicant's arguments filed 20 January 2006 have been fully considered but they are not persuasive. The electric charge distribution in space disclosed by Kane remains within the scope of claim 1 with the added amendment of "electric field or electric force caused by particle electric charge distribution in space". The electron wave function overlap,  $J(r)$ , which is either 0 in one state, or greater than zero in the other state, is determined via the J-Gate of Figure 3, by the electric field of the particle charge distribution in space. The examiner suggests that claims be drawn only to the specific semiconductor device, such as that shown in Figures 13-15, rather than broad physical principles, which may encompass many varying physical systems. Such physical principles, however, rightly belong in the specification, in order to support the understanding by someone of ordinary skill in the art of the semiconductor device. The art rejections of dependent claims 2, 5, 6, 7, 16, 21, 23, 28, 30, 31 remain.

As to claim 22, the quantum dot of Field et al. remains within the scope of being a "container" of two regions, as well as a closed system, since electrons are confined on the quantum dot. Field et al. teaches (page 1, col. 2, line 2) that on the order of 500 electrons are confined on the dot.

As to claim 45, the rejection under 35 U.S.C. 112, second paragraph, was not addressed, and therefore remains in effect.

As to claim 47, the rejection under 35 U.S.C. 112, second paragraph, was not addressed, and therefore remains in effect.

Claims 37-39 are rejected under 35 U.S.C. 102(a) as being anticipated by Science Dimension. As to claim 37, Science Dimension discloses a method of switching comprising: providing at least one particle having a wave function bound to a region, embodied as a ground state electron in a cesium atom in an atomic clock; switching at least one particle from a first lower energy state in which the wave function of said particle has a first small extent to a second higher energy state in which the wave function of the at least one particle has a second larger extent, while remaining bound to the region, embodied as exposing the cesium atoms to microwaves at a frequency which excites the ground state electron to a

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higher resonant energy state while remaining bound to the atom; and determining the state of the at least one particle or the transition of the at least one particle from one of said states to the other, embodied as ionizing the higher energy state and measuring the excited ion as part of an electric current.

Claims 37-39 are rejected under 35 U.S.C. 102(a) as being anticipated by NIST. As to claim 37, NIST discloses a method of switching comprising: providing at least one particle having a wave function bound to a region, embodied as a ground state electron in a cesium atom in an atomic clock; switching at least one particle from a first lower energy state in which the wave function of said particle has a first small extent to a second higher energy state in which the wave function of the at least one particle has a second larger extent, while remaining bound to the region, embodied as "altering" the atomic states of the cesium atom, which is understood in the art to refer to exposing the cesium atoms to microwaves at a frequency which matches the hyperfine transition frequency of cesium, thereby causing the hyperfine transition to occur, which excites the ground state electron to a higher energy (see Wikipedia); and determining the state of the at least one particle or the transition of the at least one particle from one of said states to the other, embodied as measuring the brightness of the atomic fluorescence of the cesium.

Claims 8, 10, 19, 41 are also with the scope of a cesium atom in an atomic clock. Claims 8, 10, 19 and 41 all read on a system in which a particle is switched between two states, with differing wave function size in space, due to photon interaction, and where there is a release of energy via photon emission.

As to claim 38, NIST discloses that the atomic fluorescence is measured with a fluorescence detector, which necessarily will have electrodes with a detectable voltage change induced when said switch state changes.

As to claim 39, it is understood in the art that an electrode with a detectable current change can be constructed from an electrode with a detectable voltage change by appropriate addition of a resistor.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott R. Wilson whose telephone number is 571-272-1925. The examiner can normally be reached on M-F 8:30 - 4:30 Eastern.

~~NATHAN FLYNN~~  
~~SUPERVISORY PATENT EXAMINER~~  
~~TECHNOLOGY CENTER 2800~~

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

srw